REMARKS

The presently claimed invention is drawn to a catalyst that is a combination of a monoclinic zirconia support and iridium. Applicants have shown in the examples of the present specification that such a combination provides a catalyst having surprising activity that would not be foreseen in view of conventional catalysts. The examples of the specification show, *inter alia*, that a catalyst that includes iridium and a monoclinic zirconia has superior long-term performance, stability and sulfur tolerance in comparison to catalysts that contain monoclinic zirconia and platinum or rhodium (see Example 1 on page 11, line 25 through page 12, line 19). When rhodium, platinum and iridium catalysts that are made from the same support are compared under the same conditions, the iridium catalyst is shown to be more active than the rhodium and platinum catalysts. This improvement in activity is evident in Figure 3 of the specification, reproduced below for convenience:

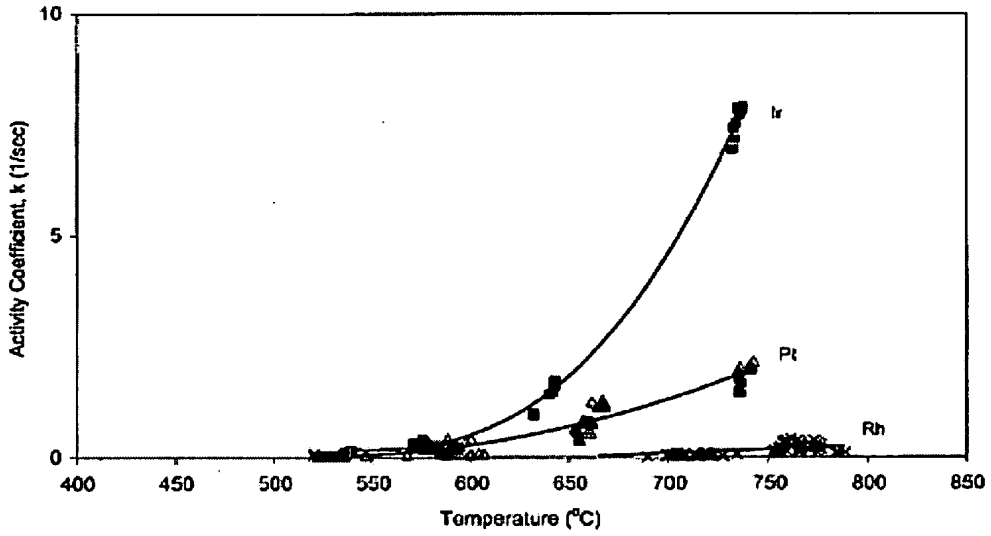

FIG. 3

As is readily evident from Figure 3 above, the iridium-containing catalyst has a substantially greater activity coefficient in comparison to the platinum and rhodium-containing catalysts. The specification points out that although iridium-containing catalysts

may have activities that are initially lower than the activities of Pt and/or Rh catalysts, upon longer use, e.g., upon aging, the iridium-containing catalyst is much more active than the rhodium- and platinum-containing catalysts.

Applicants have therefore demonstrated that the inclusion of iridium on monoclinic zirconia provides a catalyst that has substantially different long-term performance characteristics such as catalytic activity in comparison to platinum- and rhodium-containing catalysts. Applicants have thus demonstrated the criticality of using iridium in the claimed invention.

Applicants have likewise shown that a substantial improvement in catalyst performance is obtained when a monoclinic zirconia support is used in comparison to conventional aluminate/alumina supports. Example 2 on page 12, line 21 through page 13, line 6 compares the performance of two catalysts. A first catalyst is made by adding iridium to a mixed calcium aluminate/alumina support. A second catalyst is made by adding the same amount of iridium to a monoclinic zirconia support. The catalysts are otherwise prepared in the same manner. Figure 4 of the specification compares the activity of the first and second catalysts of Example 2. Figure 4 is reproduced below for convenience.

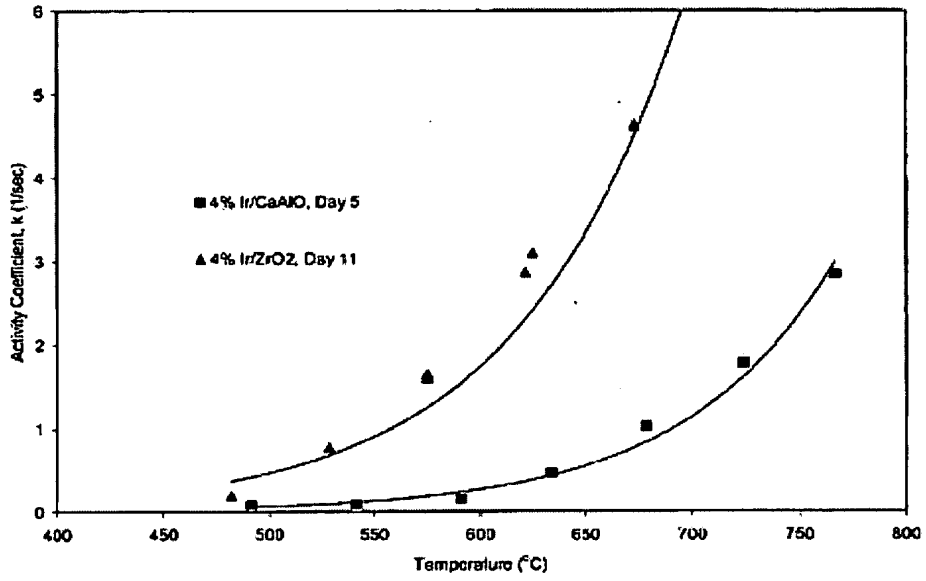

FIG. 4.

As is readily evident from Figure 4, the iridium/monoclinic zirconia catalyst is much more active than the iridium/calcium aluminate/alumina catalyst. Applicants have thus demonstrated the criticality of using a monoclinic zirconia to obtain improved catalyst activity.

The Office asserts that Claims 21-31 are obvious over Ohtsuka (U.S. 2004/0013591) in view of Wulff-Döring (U.S. 6,034,029) or Symons (U.S. 6,562,747). It appears that the Office is of the belief that the claimed catalyst is obvious because (i) Ohtsuka discloses a catalyst that contains iridium on a zirconium oxide, (ii) Wulff-Döring discloses the use of monoclinic zirconia as a catalyst, and/or (iii) Symons discloses a gas sensor electrolyte that may include iridium.

At the outset Applicants point out that the presently claimed invention and Symons are in non-analogous arts. The presently claimed invention is drawn to a catalyst whereas Symons discloses a gas sensor electrolyte (see the title of Symons). Symons discloses an iridium-containing catalyst only with regard to its use as an oxygen ionization agent in a gas electrode (column 5, lines 38-55). Symons iridium-containing catalyst is used for an entirely

different purpose in an entirely different field than the claimed invention. Symons use of an iridium catalyst on an electrolyte is not the same as the use of iridium in the claimed catalyst which is used for producing hydrogen from a fuel source.

The Office's reliance on Symons and/or the Office's reliance on the combination of Ohtsuka and Symons to reject the present claims is not supportable at least because Symons is in a non-analogous art. The Office has provided no reasoning why one of skill in the art would turn to Symons as inspiration for the presently claimed catalyst. Thus, the rejection of the present claims over Symons, alone or in combination with the other cited prior art, is not appropriate and the rejections in over Symons should be withdrawn.

The Office further appears to assert that it would be obvious to use the catalyst of Ohtsuka on the monoclinic zirconia support of Wulff-Döring. However, none of the prior art relied upon by the Office suggests or discloses that significantly improved catalyst activity may be obtained when a combination of iridium and monoclinic zirconia is used to make a catalyst. As discussed above, the claimed catalyst is able to provide superior long-term performance and catalyst activity in comparison to catalysts that are made from metals such as rhodium or platinum, or are made from conventional supports such as calcium aluminate/alumina.

Even if the Office were correct in stating that the presently claimed invention is *prima facie* obvious in view of the prior art relied on by the Office, an assertion to which Applicants do not agree, the data of the original specification prove that the catalyst of the presently claimed invention provides surprising results in view of catalysts made from conventional supports and/or metals other than iridium. The data of the original specification support the non-obviousness of the claimed invention. Applicants thus request the Office withdraw the rejections and pass all now-pending claims to allowance.

REQUEST FOR REJOINDER

Upon making a determination of allowable subject matter, the Office is requested to rejoin and allow Claims 32-34, 36-39, 41-44, and 46-49. Because the withdrawn claims depend from otherwise include all of the limitations of the allowable claims, the withdrawn claims should be rejoined and allowed (see M.P.E.P. § 821.04).

For the reasons discussed above in detail, Applicants submit that all now-pending claims are in condition for allowance. Applicants request the mailing of a Notice of Allowance to acknowledge the patentability of the presently claimed subject matter.

Respectfully submitted,

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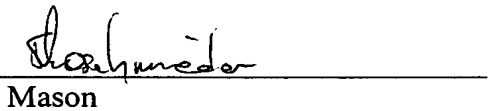

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